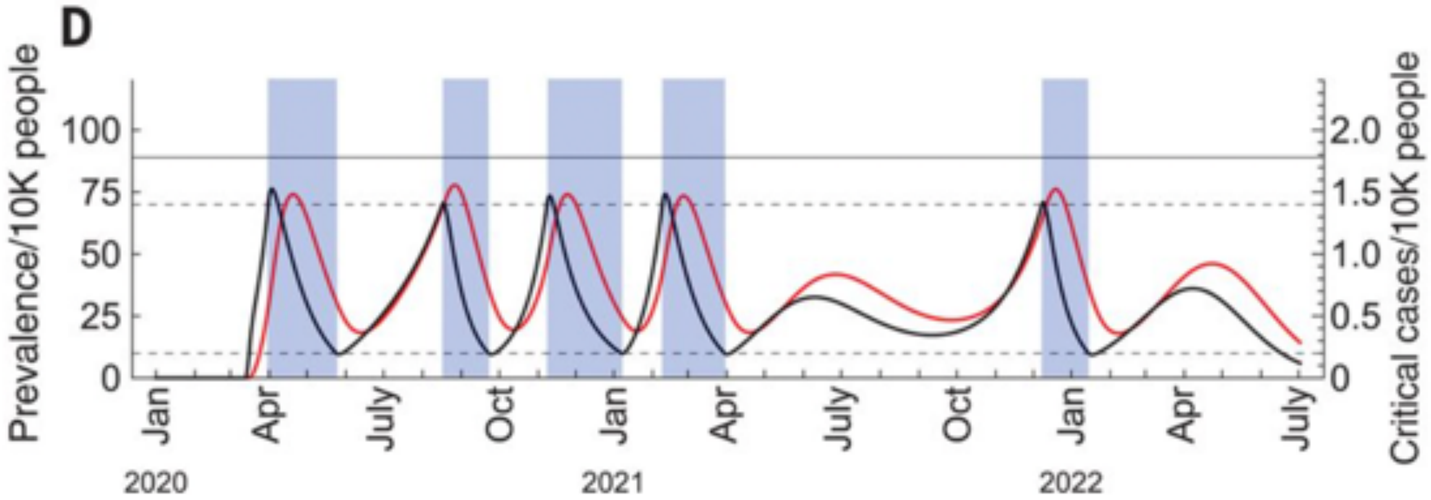
What can we do with the SIR model?

Projections

If we make a given change, how do we expect the epidemic to behave?



Kissler, Tedijanto, *et al.* (2020)

$$\frac{dS}{dt} = -\beta IS$$

$$\frac{dI}{dt} = \beta IS - \gamma I$$

$$\frac{dR}{dt} = \gamma I$$

To approximate periodic physical distancing, we can reduce β during the blue shaded regions above.

Then, we solve (simulate) the equations and can ask:

How effective will distance be at reducing cases?

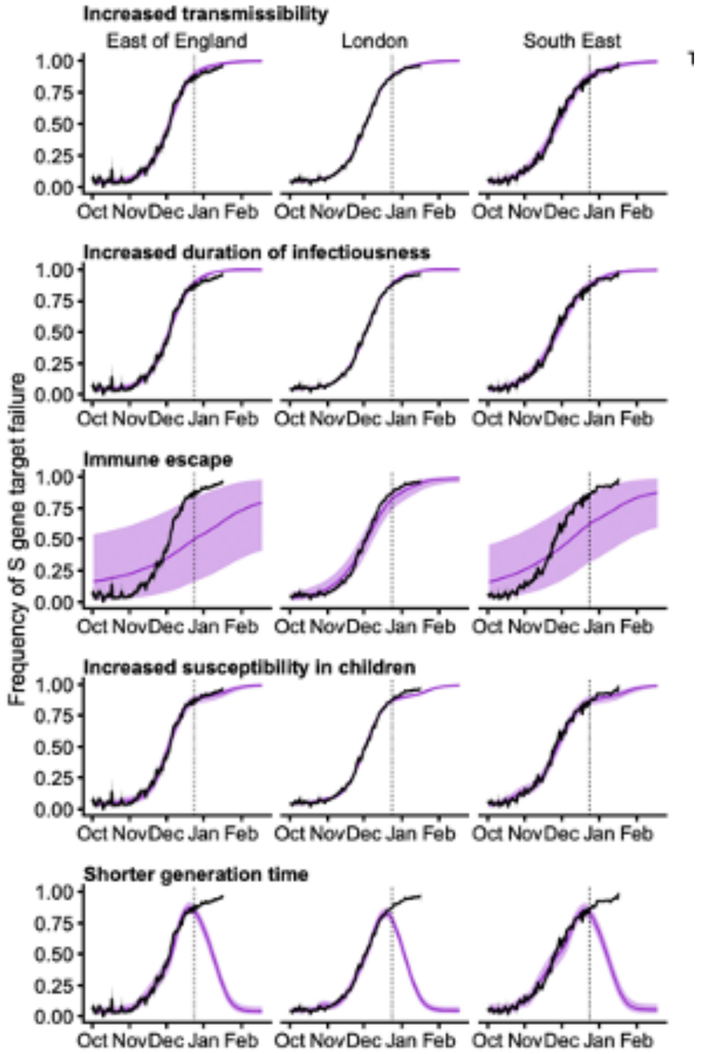
How long will distancing need to continue to keep control of the epidemic?

What can we do with the SIR model?

Model prediction
Data

Learn about the pathogen itself

Given the course of the epidemic, what can we infer about the virus?



Davies *et al.* (2021)

→ Increase β

→ Reduce γ

→ Return people from **R** to **S**

→ Increase β for children only

→ Reduce β and γ together
(more on this in a few slides!)

$$\frac{dS}{dt} = -\beta IS$$

$$\frac{dI}{dt} = \beta IS - \gamma I$$

$$\frac{dR}{dt} = \gamma I$$